DAIKIN APPLIED EUROPE S.p.A.

BAS integration guide

BACnet® protocol

Doc. Name:
D-EIGOC00101-22_01EN_EWWQ-KC

Product Name:
EWWQ-KC

Control software name:
Nayda

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1. Introduction

This document contains information to incorporate Unit Controller into a building automation system (BAS) via BACnet communication protocols.

Unit data points are accessible to a BAS via BACnet network provided that the protocol has been activated by the dedicated option.

BACnet terms are not defined. Refer to the standard BACnet specifications for definitions and details about the protocol.

2. About this document

2.1 Revision History

Version	Date	Software Version	Description
D-EIGOC00101-22EN_EWWQ-KC	2022/01/24	Nayda 1.00.A	First edition

2.2 Notice

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- **BACnet** from American Society of Heating, Refrigerating and Air-Conditioning Engineers,

2.3 Before starting

Application range

This document refers to the following components:

POL486.65	Controller

Users

Users of this document are intended to be:

- Modbus systems integrators
- Service Technicians
- Plant Engineers
- Sales staff

Conventions

POL486.65 further in this document and when proper shall be referred to as “Controller”

Abbreviation

BACnet	**B**uilding **A**utomation and **C**ontrol **Net**work
BSP	**B**oard **S**upport **P**ackage (operating system)

References

- Siemens Building Technologies - CB1J3960en - **Modbus** communication, slave mode
- The Modbus Organization - www.modbus.org

3. Safety information

Only personnel qualified in accordance with IEC (International Electrotechnical Commission) recommendations may be permitted access to electrical components. It is particularly recommended that all sources of electricity to the unit be shut off before any work is begun. Shut off main power supply at the main circuit breaker or isolator.

IMPORTANT: This equipment uses and emits electromagnetic signals. Tests have shown that the equipment conforms to all applicable codes with respect to electromagnetic compatibility.

	***RISK OF ELECTROCUTION: Even when the main circuit breaker or isolator is switched off, certain circuits may still be energized, since they may be connected to a separate power source.***
	***RISK OF BURNS: Electrical currents cause components to get hot either temporarily or permanently. Handle power cable, electrical cables and conduits, terminal box covers and motor frames with great care.***

Field of application



Use Modbus communication module only for control and monitoring functions in ventilation, air conditioning and refrigeration plants.

Intended use



Trouble-free and safe product operation of the above products presupposes transport, storage, mounting, installation, and commissioning as intended as well as careful operation.

Electrical installation



Fuses, switches, wiring and grounding must comply with local safety regulations for electrical installations.

Wiring



When wiring, strictly separate AC 230 V mains voltage from AC 24 V safety extralow voltage (SELV) to protect against electrical shock!

Commissioning and maintenance



Only qualified staff trained accordingly may prepare for use, commission, and maintain Modbus communication modules.

Maintenance of Modbus communication modules generally only means regular cleaning. We recommend removing dust and dirt from system components installed in the control panels during standard service.

Faults



Only authorized staff may diagnose and correct faults and recommission the plant. This applies to working within the panel as well (e.g. testing or changing fuses).

Storage and transport



Refer to the environmental conditions specified in the respective data sheets for storage and transport. If in doubt, contact your supplier.

Disposal



Devices contain electrical and electronic components; do not dispose of them in household garbage. Observe all local and applicable laws.

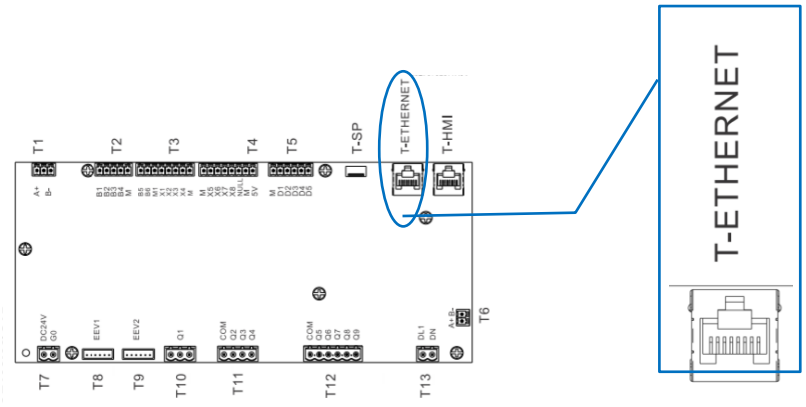
4. Commission this unit in a BACnet network

Unit controller

Unit controller is the POL468.65 and can be always integrated in a Modbus network by mean of the onboard integrated RS485 connection.

Communication software option

BACnet IP communication is available via Ethernet port as a software option available with available with connectivity kit SAP code EKRSCBMS.



5. BACnet integration list

Description	Type	ID	Name	R/W	Range
Unit Local/Remote	BI	3	ChillerLocalRemote	R	0 Network 1 Local
Unit Enable Output	BI	7	ChillerEnableOutput	R	0 Disabled 1 Enabled
Unit Run Allowed	BI	5	RunEnabled	R	0 Off 1 RunAllowed
Unit Capacity Limited	BI	6	ChillerLimited	R	0 NotLimited 1 Limited
Unit general alarm	BI	10	AlarmDigitalOutput	R	0 NoAlarm 1 Alarm
Unit On/Off	BI	4	ThermostatStatus	R	0 Thermo Off 1 Thermo On
Unit Enable Setpoint	BV	2	ChillerEnableStp	W	0 Disable 1 Enable
Clear Alarms – Network	BV	8	ClearAlarm	W	0 None 1 ClearAlarm
Unit Mode Output	MV	2	ActiveMode	R	1 Ice 2 Cool 3 Heat
Active Setpoint	AV	5	ActiveLvgWaterTarget	R	°C
Actual Capacity	AV	2	ChillerCapacity	R	%
Active Capacity Limit Output	AV	1	ActiveCapacityLimit	R	%

Description	Type	ID	Name	R/W	Range
Unit run mode	MV	1	UnitStatus	R	1 Off 2 Start 3 Run 4 PreShutdown 5 Service
Evaporator Entering Water Temp	AI	1	EntEvapWaterTemp	R	˚C
Evaporator Leaving Water Temp Unit	AI	2	LvgEvapWaterTempUnit	R	˚C
Condenser Entering Water Temperature	AI	3	EntCondWaterTemp	R	˚C
Condenser Leaving Water Temperature	AI	4	LvgCondWaterTemp	R	˚C
Evap Flow Switch Status	BI	2	EvapFlowStatus	R	0 No Flow 1 Flow
MS Ctrl Tmp	AV	151	MSCtrlTmp	R	˚C
Warning CODE	AV	903	AVWarningAlarmCode	R	See Paragraph 5.1
Problem CODE	AV	904	AVProblemAlarmCode	R	See Paragraph 5.1
Fault CODE	AV	905	AVFaultAlarmCode	R	See Paragraph 5.1
Unit Mode Setpoint – Network	MV	3	ChillerOperationMode	W	1 Ice 2 Cool 3 Heat 4 Pursuit
Cool Setpoint – Network	AV	4	NetworkCoolTempSetpoint	W	˚C
Heat Setpoint – Network	AV	6	NetworkHeatTempSetpoint	W	˚C
Measure Units	MV	47	Units	W	1 Imperial 2 Metric
Evaporator Pump #1 Fault	BV	100	EvapPump1Fault	R	0 NoAlarm 1 Alarm
Evaporator Pump #1 Status	BI	101	EvapPump1State	R	0 OffRequest 1 OnRequest

Description	Type	ID	Name	R/W	Range
Evaporator Pump #1 Run Hours	AV	102	EvapPump1OperHours	W	h
Condenser Pump #1 Fault	BV	120	CondPump1Fault	R	0 NoAlarm 1 Alarm
Condenser Pump #1 Status	BI	121	CondPump1State	R	0 OffRequest 1 OnRequest
Condenser Pump #1 Run Hours	AV	122	CondPump1OperHours	W	h
Evaporator VFD Pump - Fixed Speed 1	AV	150	EvapVPF'FixSpeedSetpt1	W	%
Evaporator VFD Pump - Fixed Speed 2	AV	151	EvapVPF'FixSpeedSetpt2	W	%
Evaporator VFD Pump - Standby Speed	AV	152	EvapVPF'StbySpeedSetpt	W	%
Evaporator VFD Pump - Actual Speed	AV	153	EvapVPF'ActSpeed	R	%
Evaporator VFD Pump - Building Differential Pressure Setpoint	AV	154	EvapVPF'LoadDifPresSetpt	W	kPa
Evaporator VFD Pump - Unit Differential Pressure Setpoint	AV	155	EvapVPF'EvapDifPresSetpt	W	kPa
Evaporator VFD Pump - Building Differential Pressure	AI	156	EvapVPF'LoadDifPres	R	kPa
Evaporator VFD Pump - Unit Differential Pressure	AI	157	EvapVPF'EvapDifPress	R	kPa
Evaporator VFD Pump - Bypass Valve State	MV	158	EvapVPF'BypVlvSta	R	1 Closed 2 Opened
Evaporator VFD Pump - DeltaTemperature Setpoint	AV	159	EvapVPF'DeltaTempSp	W	°Dc
Evaporator VFD Pump - DeltaTemperature	AV	160	EvapVPF'DeltaTemp	R	°Dc
Condenser VFD Pump - Fixed Speed 1	AV	170	CondVPF'FixSpeedSetpt1	W	%
Condenser VFD Pump - Fixed Speed 2	AV	171	CondVPF'FixSpeedSetpt2	W	%
Condenser VFD Pump - Standby Speed	AV	172	CondVPF'StbySpeedSetpt	W	%
Condenser VFD Pump - Actual Speed	AV	173	CondVPF'ActSpeed	R	%
Condenser VFD Pump - Building Differential Pressure Setpoint	AV	174	CondVPF'LoadDifPresSetpt	W	kPa
Condenser VFD Pump - Unit Differential Pressure Setpoint	AV	175	CondVPF'CondDifPresSetpt	W	kPa
Condenser VFD Pump - Building Differential Pressure	AI	176	CondVPF'LoadDifPres	R	kPa

Description	Type	ID	Name	R/W	Range
Condenser VFD Pump - Unit Differential Pressure	AI	177	CondVPF'CondDifPress	R	kPa
Condenser VFD Pump - Bypass Valve State	MV	178	CondVPF'BypVlvSta	R	1 Closed 2 Opened
Condenser VFD Pump - DeltaTemperature Setpoint	AV	179	CondVPF'DeltaTempSp	W	°Dc
Condenser VFD Pump - DeltaTemperature	AV	180	CondVPF'DeltaTemp	R	°Dc
Circuit #1 Status	MV	300	C1State	R	1 Off 2 Preopen 3 Start 4 Run 5 Pumpdown
Circuit #1 Comp #1 – State	BV	321	C1Comp1Status	R	0 Off 1 On
Circuit #1 Comp #1 – Starts	AV	322	C1Comp1Starts	W	
Circuit #1 Comp #1 - Run Hours	AV	323	C1Comp1Hours	W	h
Disconnect Mode	MV	330	Disconnect	W	1 No 2 Yes
Circuit #2 Status	MV	400	C2State	R	1 Off 2 Preopen 3 Start 4 Run 5 Pumpdown
Circuit #2 Comp #1 – State	BV	421	C2Comp1Status	R	0 Off 1 On
Circuit #2 Comp #1 – Starts	AV	422	C2Comp1Starts	W	
Circuit #2 Comp #1 - Run Hours - High	AV	423	C2Comp1Hours	W	h

Description	Type	ID	Name	R/W	Range
CommonLWTSenf	BV	502	CommonLWTSenf	R	0 NoAlarm 1 Alarm
CommonCondLWT - Sensor Fault	BV	503	CommonCondLWTSenf	R	0 NoAlarm 1 Alarm
Master Comm Err	BV	20	MasterCommErr	R	0 NoAlarm 1 Alarm
Slave 1 Comm Err	BV	21	Slave1CommErr	R	0 NoAlarm 1 Alarm
Slave 2 Comm Err	BV	22	Slave2CommErr	R	0 NoAlarm 1 Alarm
Slave 3 Comm Err	BV	23	Slave3CommErr	R	0 NoAlarm 1 Alarm
Slave Load #1	AV	1150	Slave1Load	R	%
Slave State #1	MV	1154	Slave1State	R	1 Off 2 Run 3 Alarm 3 ComErr
Slave Load #2	AV	1168	Slave2Load	R	%
Slave State #2	MV	1172	Slave2State	R	1 Off 2 Run 3 Alarm 4 ComErr 5 Not Config
Slave Load #3	AV	1186	Slave3Load	R	%

Description	Type	ID	Name	R/W	Range
Slave State #3	MV	1190	Slave3State	R	1 Off 2 Run 3 Alarm 4 ComErr 5 Not Config

5.1 Alarm Codes and Indexes

Premise

Unit communicates to BAS the status alarm through Codes and Indexes.
Those are grouped in 3 level of alarm

Levels of Alarm

The three levels of alarms are as it follows:

Level	Description
Warning	They are notifications from unit or equipment of an incorrect status
Problem	They are notifications from unit or equipment of a status that does allow unit to work properly
Fault	They are notifications from unit or equipment (circuits, Compressors, Sensors, etc) that can cause stop of the unit or specific equipement

Index

Index describes the general cause of the notification

Code

Code describes which equipment or device of the unit is generating a notification

CODE	INDEX	LEVEL	Device	Description
257	1	Warning	Unit	Condenser Entering Water Temperature Sensor Failure
513	2	Warning	Unit	Evaporator Entering Water Temperature Sensor Failure
769	3	Warning	Unit	Liquid Line Refrigerant Temperature Sensor Failure
1025	4	Warning	Unit	Condenser Leaving Water Temperature Sensor Failure (STOP if Heat)

CODE	INDEX	LEVEL	Device	Description
1281	5	Warning	Unit	Evaporator pump maintenance
1537	6	Warning	Unit	Condenser pump maintenance
1829	7	Warning	C1.Comp1	Compressor maintenance #n
1833			C1.Comp2	
1837			C1.Comp3	
1861			C2.Comp1	
1865			C2.Comp2	
1869			C2.Comp3	
2049	8	Warning	Unit	Bad setpoint override input
2305	9	Warning	Unit	Bad demand limit input
2561	10	Warning	Unit	Power Loss While Running
2817	11	Warning	Unit	Unit Power Restore
3105	12	Warning	Circuit 1	Circuit Failed Pumpdown
3137			Circuit 2	
3329	13	Warning	Unit	External Event
3585	14	Warning	Unit	Bad Current Limit Input
3841	15	Warning	Unit	Option Controller Communication Failed
4128	16	Warning	Circuit 1	Low Refrigerant Charge
4160			Circuit 2	
4352	17	Warning	Unit	Chiller network Communication Failure
6177	24	Warning	Circuit 1	Economizer Pressure Sensor Fault #n
6209			Circuit 2	
6433	25	Warning	Circuit 1	Economizer Temperature Sensor Fault #n
6465			Circuit 2	
6689	26	Warning	Circuit 1	Economizer EXV Motor Fault
6721			Circuit 2	

CODE	INDEX	LEVEL	Device	Description
6945	27	Warning	Circuit 1	DC Fan Fault
6977			Circuit 2	
7169	28	Warning	Unit	Economizer EXV Module Communications Fault
9729	38	Warning	Unit	Heat Recovery Entering Water Temperature Sensor Fault
9985	39	Warning	Unit	Heat Recovery Leaving Water Temperature Sensor Fault
PROBLEM				
16418	64	Problem	Circuit 1	Power Loss While Running #n
16450			Crcuit 2	
16642	65	Problem	Unit	START INHIBITED - Ambient Temperature Low
16898	66	Problem	Unit	INHIBIT LOAD – Condenser Pressure High
17186	67	Problem	Circuit 1	INHIBIT LOAD – Condenser Pressure High #n
17218			Crcuit 2	
17410	68	Problem	Unit	UNLOAD – Condenser Pressure High
17698	69	Problem	Circuit 1	UNLOAD – Condenser Pressure High #n
17730			Crcuit 2	
18178	71	Problem	Pump 1	PUMP START ATTEMPTED - Condenser Pump #1 Failure
18434	72	Problem	Pump 2	PUMP START ATTEMPTED - Condenser Pump #2 Failure
18722	73	Problem	Circuit 1	INHIBIT LOAD - Discharge Temperature High #n
18754			Crcuit 2	
18946	74	Problem	Unit	NO EWT RESET - Entering Evaporator Temperature Sensor Failure
19202	75	Problem	Unit	INHIBIT LOAD - Evaporator Pressure Low
19490	76	Problem	Circuit 1	INHIBIT LOAD - Evaporator Pressure Low #n
19522			Crcuit 2	
19714	77	Problem	Unit	UNLOAD - Evaporator Pressure Low
20002	78	Problem	Circuit 1	UNLOAD - Evaporator Pressure Low #n
20034			Crcuit 2	

CODE	INDEX	LEVEL	Device	Description
20262	79	Problem	C1.Comp1	UNLOAD - Compressor Motor Current High #n
20266			C1.Comp2	
20294			C2.Comp1	
20298			C2.Comp2	
20738	81	Problem	Pump 1	PUMP START ATTEMPTED - Evaporator Pump #1 Failure
20994	82	Problem	Pump 2	PUMP START ATTEMPTED - Evaporator Pump #2 Failure
21250	83	Problem	Unit	(Check Chiller Display for Cause)
21542	84	Problem	C1.Comp1	INHIBIT LOAD - Compressor Motor Current High #n
21546			C1.Comp2	
21574			C2.Comp1	
21578			C2.Comp2	
FAULT				
1027	4	Fault	Unit	Condenser Leaving Water Temperature Sensor Failure
26151	102	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Discharge Pressure Sensor Fault
26155			C1.Comp2	
26407	103	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Suction Pressure Low
26411			C1.Comp2	
26663	104	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Discharge Pressure High
26667			C1.Comp2	
27943	109	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Surge Temperature
27947			C1.Comp2	
31015	121	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Suction Pressure Sensor Fault
31019			C1.Comp2	
32551	127	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Low pressure ratio #n
32555			C1.Comp2	
32583			C2.Comp1	

CODE	INDEX	LEVEL	Device	Description
32587			C2.Comp2	
32771	128	Fault	Unit	UNIT SHUTDOWN - Outside Air Temperature Sensor Fault
33063	129	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Current Overload Trip #n
33067			C1.Comp2	
33095			C2.Comp1	
33099			C2.Comp2	
33063	129	Fault	Circuit 1	CIRCUIT SHUTDOWN - Motor Current High
33095			Circuit 2	
33795	132	Fault	Unit	UNIT SHUTDOWN - Motor Protector Trip
34087	133	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Motor Protector Trip #n
34091			C1.Comp2	
34119			C2.Comp1	
34123			C2.Comp2	
34083	133	Fault	Circuit 1	CIRCUIT SHUTDOWN - Motor Protector Trip
34115			Circuit 2	
34343	134	Fault	C1.Comp1	Compressor overload #n
34347			C1.Comp2	
34375			C2.Comp1	
34379			C2.Comp2	
34599	135	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Motor Temperature High #n
34603			C1.Comp2	
34631			C2.Comp1	
34635			C2.Comp2	
34855	136	Fault	C1.Comp1	Compressor Shutdown - Motor Tempeature Sensor Fault #n
34859			C1.Comp2	
34887			C2.Comp1	

CODE	INDEX	LEVEL	Device	Description
34891			C2.Comp2	
35111	137	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Phase Loss #n
35115			C1.Comp2	
35143			C2.Comp1	
35147			C2.Comp2	
35367	138	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Phase Reversal #n
35371			C1.Comp2	
35399			C2.Comp1	
35403			C2.Comp2	
35623	139	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Overvoltage #n
35627			C1.Comp2	
35655			C2.Comp1	
35659			C2.Comp2	
35879	140	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Undervoltage #n
35883			C1.Comp2	
35911			C2.Comp1	
35915			C2.Comp2	
36099	141	Fault	Unit	COMPRESSOR SHUTDOWN - Condenser Pressure Sensor Fault
36391	142	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Condenser Pressure Sensor Fault #n
36935			C1.Comp2	
36423			C2.Comp1	
36427			C2.Comp2	
36387	142	Fault	Circuit 1	CIRCUIT SHUTDOWN - Condenser Pressure Sensor Fault #n
36419			Circuit 2	
36611	143	Fault	Unit	COMPRESSOR SHUTDOWN - Condenser Water Flow Loss
36867	144	Fault	Unit	COMPRESSOR SHUTDOWN - Condenser Pressure High

CODE	INDEX	LEVEL	Device	Description
37159	145	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Condenser Pressure High #n
37163			C1.Comp2	
37191			C2.Comp1	
37195			C2.Comp2	
37155	145	Fault	Circuit 1	CIRCUIT SHUTDOWN - Condenser Pressure High #n
37187			Circuit 2	
37415	146	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Current High with Compressor OFF #n
37419			C1.Comp2	
37447			C2.Comp1	
37451			C2.Comp2	
37671	147	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Discharge Temperature Sensor Fault #n
37675			C1.Comp2	
37703			C2.Comp1	
37707			C2.Comp2	
37927	148	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Discharge Temperature High #n
37931			C1.Comp2	
37959			C2.Comp1	
37963			C2.Comp2	
38147	149	Fault	Unit	UNIT SHUTDOWN - Condenser Entering Water Temperature Sensor Fault
38403	150	Fault	Unit	UNIT SHUTDOWN - Evaporator Water Flow Loss
38659	151	Fault	Unit	UNIT SHUTDOWN - Evaporator LWT or EWT Low (Freeze)
38915	152	Fault	Unit	COMPRESSOR SHUTDOWN - Evaporator Pressure Low
39207	153	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Evaporator (or Suction) Pressure Low #n
39211			C1.Comp2	
39239			C2.Comp1	

CODE	INDEX	LEVEL	Device	Description
39243			C2.Comp2	
39203	153	Fault	Circuit 1	CIRCUIT SHUTDOWN - Evaporator (or Suction) Pressure Low
39235			Circuit 2	
39427	154	Fault	Unit	COMPRESSOR SHUTDOWN - Evaporator Pressure Sensor Fault
39719	155	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Evaporator Pressure Sensor Fault #n
39723			C1.Comp2	
39751			C2.Comp1	
39755			C2.Comp2	
39715	155	Fault	Circuit 1	CIRCUIT SHUTDOWN - Evaporator Pressure Sensor Fault #n
39747			Circuit 2	
39975	156	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Ground Fault Trip #n
39979			C1.Comp2	
40007			C2.Comp1	
40011			C2.Comp2	
40231	157	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Lift Pressure Low #n
40235			C1.Comp2	
40263			C2.Comp1	
40267			C2.Comp2	
40487	158	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Liquid Line Pressure Sensor Fault #n
40491			C1.Comp2	
40519			C2.Comp1	
40523			C2.Comp2	
40739	159	Fault	Circuit 1	CIRCUIT SHUTDOWN - Liquid Line Temperature Sensor Fault #n
40771			Circuit 2	
40963	160	Fault	Unit	UNIT LOCKOUT - Number of Allowed Re-Starts Exceeded
41255	161	Fault	C1.Comp1	COMPRESSOR LOCKOUT - Number of Allowed Re-Starts Exceeded #n

CODE	INDEX	LEVEL	Device	Description
41259			C1.Comp2	
41287			C2.Comp1	
41291			C2.Comp2	
41251	161	Fault	Circuit 1	CIRCUIT LOCKOUT - Number of Allowed Re-Starts Exceeded #n
41283			Circuit 2	
41475	162	Fault	Unit	UNIT SHUTDOWN - Evaporator Leaving Water Temperature Sensor Fault
41731	163	Fault	Unit	UNIT SHUTDOWN - Evaporator Entering Water Temperature Sensor Fault
42023	164	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Evaporator Leaving Water Temperature Sensor Fault #n
42027			C1.Comp2	
42055			C2.Comp1	
42059			C2.Comp2	
42019	164	Fault	Circuit 1	CIRCUIT SHUTDOWN - Evaporator Leaving Water Temperature Sensor Fault #n
42051			Circuit 2	
42243	165	Fault	Unit	UNIT STOP - Mechanical High Pressure Trip
42535	166	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Mechanical High Pressure Trip #n
42539			C1.Comp2	
42567			C2.Comp1	
42571			C2.Comp2	
42531	166	Fault	Circuit 1	CIRCUIT SHUTDOWN - Mechanical High Pressure Trip #n
42563			Circuit 2	
42791	167	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Net Pressure Low #n
42795			C1.Comp2	
42823			C2.Comp1	
42827			C2.Comp2	
43047	168	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Feed Temperature High #n

CODE	INDEX	LEVEL	Device	Description
43051			C1.Comp2	
43079			C2.Comp1	
43083			C2.Comp2	
43303	169	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Feed Temperature Low #n
43307			C1.Comp2	
43335			C2.Comp1	
43339			C2.Comp2	
43559	170	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Feed Temperature Sensor Fault #n
43563			C1.Comp2	
43591			C2.Comp1	
43595			C2.Comp2	
43815	171	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Level Low #n
43819			C1.Comp2	
43847			C2.Comp1	
43851			C2.Comp2	
44071	172	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Delta Pressure High #n
44075			C1.Comp2	
44103			C2.Comp1	
44107			C2.Comp2	
44327	173	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Feed Pressure Sensor Fault #n
44331			C1.Comp2	
44359			C2.Comp1	
44363			C2.Comp2	
44583	174	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Sump Pressure Sensor Fault #n
44587			C1.Comp2	
44615			C2.Comp1	

CODE	INDEX	LEVEL	Device	Description
44619			C2.Comp2	
44839	175	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Oil Sump Temperature Sensor Fault #n
44843			C1.Comp2	
44871			C2.Comp1	
44875			C2.Comp2	
45059	176	Fault	Unit	SHUTDOWN – Phase Voltage Protection
45091			Circuit 1	
45123			Circuit 2	
45351	177	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Starter Fault Compressor #n
45355			C1.Comp2	
45383			C2.Comp1	
45387			C2.Comp2	
45607	178	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - No Starter Transition #n
45611			C1.Comp2	
45639			C2.Comp1	
45643			C2.Comp2	
45863	179	Fault	C1.Comp1	COMPRESSOR START ABORT - Oil Pressure Low #n
45867			C1.Comp2	
45895			C2.Comp1	
45899			C2.Comp2	
46119	180	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Subcooling Low #n
46123			C1.Comp2	
46151			C2.Comp1	
46155			C2.Comp2	
46375	181	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Surge Suction Superheat High-Running #n
46379			C1.Comp2	

CODE	INDEX	LEVEL	Device	Description
46417			C2.Comp1	
46411			C2.Comp2	
46631	182	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Surge Suction Superheat High-Starting #n
46635			C1.Comp2	
46663			C2.Comp1	
46667			C2.Comp2	
46887	183	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Suction Temperature Sensor Fault #n
46891			C1.Comp2	
46919			C2.Comp1	
46923			C2.Comp2	
46883	183	Fault	Circuit 1	CIRCUIT SHUTDOWN - Suction Temperature Sensor Fault #n
46915			Circuit 2	
47143	184	Fault	C1.Comp1	COMPRESSOR START ABORT - Vanes Open OR No Start – Interlock Switch #n
47147			C1.Comp2	
47175			C2.Comp1	
47179			C2.Comp2	
47399	185	Fault	C1.Comp1	COMPRESSOR SHUTDOWN – Compressor Fault #n
47403			C1.Comp2	
47431			C2.Comp1	
47435			C2.Comp2	
47619	186	Fault	Unit	UNIT STOP - Mechanical Low Pressure Trip
47911	187	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Mechanical Low Pressure Trip #n
47915			C1.Comp2	
47943			C2.Comp1	
47947			C2.Comp2	
48131	188	Fault	Unit	

CODE	INDEX	LEVEL	Device	Description
48163			Circuit 1	Controller board offline #n (Circuit number describe Control board number. 0=Unit alarm for Alarm/Limit extension module)
48195			Circuit 2	
48419	189	Fault	Circuit 1	CIRCUIT SHUTDOWN - No Pressure Change After Start
48451			Circuit 2	
48675	190	Fault	Circuit 1	CIRCUIT SHUTDOWN - No Pressure at Startup
48707			Circuit 2	
48935	191	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Slide position sensor Fault #n
48939			C1.Comp2	
48967			C2.Comp1	
48971			C2.Comp2	
49155	192	Fault	Unit	UNIT STOP - Emergency Stop Alarm
49411	193	Fault	Unit	UNIT STOP - Evaporator Water Temperatures Inverted
49667	194	Fault	Unit	UNIT STOP - External Alarm
49923	195	Fault	Unit	Evaporator Leaving Water Temperature 1 Sensor Fault
50179	196	Fault	Unit	Evaporator Leaving Water Temperature 2 Sensor Fault
50435	197	Fault	Unit	CIRCUIT SHUTDOWN - Evaporator 1 Freeze Protection
50691	198	Fault	Unit	CIRCUIT SHUTDOWN - Evaporator 2 Freeze Protection
50983	199	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - COMPRESSOR VFD Fault #n
50987			C1.Comp2	
51015			C2.Comp1	
51019			C2.Comp2	
51239	200	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - COMPRESSOR VFD Overheat Fault #n (This Fault is detected by Controller, not VFD)
51243			C1.Comp2	
51271			C2.Comp1	
51275			C2.Comp2	

CODE	INDEX	LEVEL	Device	Description
51495	201	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - COM ERROR With COMPRESSOR VFD #n
51499			C1.Comp2	
51527			C2.Comp1	
51531			C2.Comp2	
51751	202	Fault	C1.Comp1	COMPRESSOR SHUTDOWN - Low Discharge Superheat #n
51755			C1.Comp2	
51783			C2.Comp1	
51787			C2.Comp2	
52519	205	Fault	Circuit 1	COMPRESSOR SHUTDOWN - COMPRESSOR VFD Temperature Low #n
52551			Circuit 2	
57859	226	Fault	Unit	UNIT SHUTDOWN - High Water Temperature Fault
58371	228	Fault	Unit	UINT SHUTDOWN - Phase Voltage Monitoring Alarm
58403	228	Fault	Circuit 1	CIRCUIT SHUTDOWN - Phase Voltage Monitoring Alarm
58435			Circuit 2	
58915	230	Fault	Circuit 1	CIRCUIT SHUTDOWN - Refrig Charge
58947			Circuit 2	

6. Annex B – PICS for BACnet

6.1 BACnet standardized device profile

☐	BACnet Operator Workstation	(B-OWS)
☒	BACnet Building Controller	(B-BC)
☐	BACnet Advanced Application Controller	(B-AAC)
☐	BACnet Application Specific Controller	(B-ASC)
☐	BACnet Smart Sensor	(B-SS)
☐	BACnet Smart Actuator	(B-SA)

6.2 BACnet interoperability building blocks supported

Data sharing	Data Sharing – ReadProperty-A	DS-RP-A
	Data Sharing – ReadProperty-B	DS-RP-B
	Data Sharing – ReadPropertyMultiple-A	DS-RPM-A
	Data Sharing – ReadPropertyMultiple-B	DS-RPM-B
	Data Sharing – WriteProperty-A	DS-WP-A
	Data Sharing – WriteProperty-B	DS-WP-B
	Data Sharing – WritePropertyMultiple-B	DS-WPM-B
	Data Sharing – COV-B	DS-COV-B
	Data Sharing – COV-A	DS-COV-A
Alarm and event management	Alarm and Event – Notification Internal-B	AE-N-I-B
	Alarm and Event – AcknowledgeAlarm-B	AE-ACK- B
	Alarm and Event – Information-B	AE-INFO-B
	Alarm and Event – Alarm Summary-B	AE-ASUM-B
	Alarm and Event – Event-Enrollment Summary-B	AE-ESUM-B
Scheduling	Scheduling – Internal-B	SCHED-I-B
	Scheduling – External-B	SCHED-E-B
Trending	Trending-Viewing and Modifying Trends Internal-B	T-VMT-I-B
	Trending-Automated Trend Retrieval-B	T-ATR-B
Device management	Device Management – Dynamic Device Binding-A	DM-DDB-A
	Device Management – Dynamic Device Binding-B	DM-DDB-B
	Device Management – Dynamic Object Binding-B	DM-DOB-B
	Device Management – DeviceCommunicationControl-B	DM-DCC-B
	Device Management – TimeSynchronization-B	DM-TS-B
	Device Management – UTCTimeSynchronization-B	DM-UTC-B
	Device Management – ReinitializeDevice-B	DM-RD-B

	Device Management – List Manipulation-B	DM-LM-B
	Device Management – Object Creation and Deletion-B	DM-OCD-B
	Device Management – Backup and Restore-B	DM-BR-B
Network management	Network Management-Connection Establishment-A	NM-CE-A

6.3 BACnet standard object types supported

Object type	Supported	Can be created dynamically	Can be deleted dynamically
Analog Input	☒	☐	☐
Analog Output	☒	☐	☐
Analog Value	☒	☐	☐
Binary Input	☒	☐	☐
Binary Output	☒	☐	☐
Binary Value	☒	☐	☐
Calendar	☒	☐	☐
Command	☐	☐	☐
Device	☒	☐	☐
Event Enrollment	☒	☒	☒
File	☒	☐	☐
Group	☐	☐	☐
Loop	☐	☐	☐
Multi-State Input	☒	☐	☐
Multi-State Output	☒	☐	☐
Multi-State Value	☒	☐	☐
Notification Class	☒	☐	☐
Program	☐	☐	☐
Schedule	☒	☐	☐
Averaging	☐	☐	☐
Trend Log	☒	☐	☐
Life-Safety-Point	☐	☐	☐
Life-Safety-Zone	☐	☐	☐
Accumulator	☐	☐	☐
Pulse-Converter	☐	☐	☐

6.4 BACnet standard object types description

Analog Input

Property supported	Writable	Range restrictions
Object_Identifier		
Object_Name		
Object_Type		
Present_Value	X	
Description		
Status_Flags		
Event_State		
Reliability		
Out_Of_Service	X	
Units		
Max_Pres_Value		
Min_Pres_Value		

		Priority_Array		
		Relinquish_Default	X	
		COV_Increment	X	0 .. maxReal
		Time_Delay		
		Notification_Class		
		High_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
		Low_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
		Deadband	X	0 .. maxReal
		Limit_Enable	X	
		Event_Enable	X	
		Acked_Transitions		
		Notify_Type		
		Event_Time_Stamps		
Analog Output		**Property supported**	**Writable**	**Range restrictions**
		Object_Identifier		
		Object_Name		
		Object_Type		
		Present_Value	X	
		Description		
		Status_Flags		
		Event_State		
		Reliability		
		Out_Of_Service	X	
		Units		
		Max_Pres_Value		
		Min_Pres_Value		
		Priority_Array		
		Relinquish_Default	X	
		COV_Increment	X	0 .. maxReal
		Time_Delay		
		Notification_Class		
		High_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
		Low_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
		Deadband	X	0 .. maxReal
		Limit_Enable	X	
		Event_Enable	X	
		Acked_Transitions		
		Notify_Type		
		Event_Time_Stamps		
Analog Value		**Property supported**	**Writable**	**Range restrictions**
		Object_Identifier		
		Object_Name		
		Object_Type		
		Present_Value	X	Depends on the Unit
		Description		
		Status_Flags		

		Event_State		
		Reliability		
		Out_Of_Service	X	
		Units		
		Max_Pres_Value		
		Min_Pres_Value		
		Priority_Array		
		Relinquish_Default	X	
		COV_Increment	X	0 .. maxReal
		Time_Delay		
		Notification_Class		
		High_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
		Low_Limit	X	Min_Pres_Value <= x <=Max_Pres_Value And High_Limit > Low_Limit
		Deadband	X	0 .. maxReal
		Limit_Enable	X	
		Event_Enable	X	
		Acked_Transitions		
		Notify_Type		
		Event_Time_Stamps		
Analog Value (setpoints)		**Property supported**	**Writable**	**Range restrictions**
		Object_Identifier		
		Object_Name		
		Object_Type		
		Present_Value	X(1)	Depends on the Unit
		Units		
		Status_Flags		
		COV_Increment	X	0 .. maxReal
		Out_Of_Service	X(1)	
		Event_State		
		(1) Writeable if Out_Of_Service=True		
Binary Input		**Property supported**	**Writable**	**Range restrictions**
		Object_Identifier		
		Object_Name		
		Object_Type		
		Description		
		Present_Value	X(1)	
		Status_Flags		
		Out_Of_Service	X	
		Event_State		
		Inactive_Text		
		Active_Text		
		Polarity	X	
		Notification_Class		
		Reliability		
		Acked_Transitions		
		Event_Enable	X	
		Alarm_Value	X	
		Notify_Type		
		Time_Delay		

		Event_Time_Stamps		
		Elapsed-active-time	X	Only 0
		Time-of-active-time-reset		
		(1) Writeable if Out_Of_Service=True		
Binary Output		**Property supported**	**Writable**	**Range restrictions**
		Object_Identifier		
		Object_Name		
		Object_Type		
		Description		
		Present_Value	X	
		Status_Flags		
		Out_Of_Service	X	
		Event_State		
		Inactive_Text		
		Active_Text		
		Notification_Class		
		Reliability		
		Acked_Transitions		
		Event_Enable	X	
		Notify_Type		
		Time_Delay		
		Event_Time_Stamps		
		Polarity	X	
		Feedback_Value		
		Priority_Array		
		Relinquish_Default	X	
		Elapsed-active-time	X	Only 0
		Time-of-active-time-reset		

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